A CLINICAL STUDY OF PERCUTANEOUS LIGATION OF VAS FOR MALE STERILIZATION

THESIS
FOR MASTER OF SURGERY
(GENERAL SURGERY)

28242

BUNDELKHAND UNIVERSITY
JHANSI
1985

PRADEEP GARG

DEDICATED

TO

ALL THOSE PATIENTS/PERSONS

WHO HAVE BEEN THE SUBJECTS

OF THIS PROJECT.

THEY

CAME FORWARD

FOR

A

GOOD CAUSE OF THE NATION.

A C K N O W L E D G E M E N T S

Today, when I pick up my pen to express my heartfelt thanks to all those who helped me realise what I consider so dear, I have no dearth of feelings but only an understanding of the futility of my expression. For, I am sure, I can never manage to bringforth my sincere gratitude towards all who have meant so much in the formation of this project. Yet, I shall try.

To my esteemed and learned teacher Dr. S. L. Agarwal, M.S., F.R.C.S., Professor and Head, Department of General Surgery, M.L.B. Medical College, Hospital, Jhansi, for whom my reverence has always been at its zenith. I attempt to express my sense of indebtedness from the deepest recessess of my heart. His able guidance, constructive and valuable suggestions, criticism and meticulous attention have gone a long way towards the success of this work.

Words fail to express my deepest sense of gratitude to Dr. R. K. Gupta, M.D., Reader, Department of Pathology, M.L.B. Medical College, Jhansi, for his constant and consistent help. He has been too kind to help me, even at his personal inconveniences, at every stage of this work. His keen interest and attention in the day-to-day work was a source of great encouragement for me.

The fatherly attitude, affectionate nature and heartening words of Dr. S. P. Atri, M.S., F.R.C.S., Reader, Department of General Surgery, constantly provided the confidence and enthusiasm so essentially vital to such a project. His aversion to execuses and intolerance of lethargy kept me on my toes and spurred me throughout. I find myself lacking when it comes to choosing adequate words to express my gratitude to him.

This study is a reflection of discerning criticism and seasoned rationale of Dr. Dinesh Pratap Srivastava, M.S., Lecturer, Department of General Surgery, M.L.B. Medical College, Hospital, Jhansi. Used to calling, a spade a spade, his uncompromising standards and masterly guidance, set the trend & pace for this work. Without banking upon his unlimited knowledge, I am sure it would have been impossible to complete this awesome task. I find myself perpetually indebted to him.

I am highly obliged to Dr. R. P. Kala, Dr. Mohan Singh and Dr. K. P. Singh, Reader, Lecturer and Plastic Surgeon respectively in the department of General Surgery for their great support and helpfull suggestions from time to time.

Much of any merit this work may be found to have, is due to the generosity of Dr. Navnit Agarwal, M.D., Lecturer in the deparument of Medicine, M.L.B. Medical College, Hospital, Jhansi, in putting his profound knowledge and practical experience at my disposal. His constructive criticism and valuable opinions have helped shape the study to its present form.

Although friends perhaps do not need these words, but I would fail in my duty by not mentioning them. Dr. Ajai Agarwal, Dr. M. K. Tiwari, Dr. R. N. Tondon helped me at various stages of this work. I fail in my duty if I do not appreciate the moral support and indispensible help provided by Dr. Raj Kumar, M.S., Senior Resident in the department of Neurosurgery, G.B. Pant Hospital, New Delhi.

I have no words to express my gratitude to my parents for their constant moral support in the dreaded days of hard work and for extending a helpful hand beyond all limits and expectations.

I am also thankful to Mr. Phool Chandra Sachan for his meticulous care and painstaking labour in preparing a neat typescript of the present work.

Dated: 5th June, 1984

(PRADEEP GARG)

DEPARTMENT OF GENERAL SURGERY,
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C E R T I F I C A T E

This is to certify that work entitled "A CLINICAL STUDY OF PERCUTANEOUS LIGATION OF VAS FOR MALE STERILIZATION" which is being submitted as THESIS for M.S.(General Surgery) examination, 1985 of Bundelkhand University, by DR. PRADEEP GARG, has been carried out under my direct guidance and supervision. His results and observations have been checked and verified by me from time to time.

He has put in the necessary stay in the department of General Surgery as per university regulations.

Dated: 5th July, 1984.

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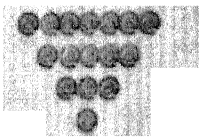
Dated: 5TH JULY, 1984

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INTRODUCTION

I N T R O D U C T I O N

It was as early as 1897, that Dr. H. G.Lennender of Upsala, Sweden performed first operation on vas. For the purpose of sterilization Dr. Herry Sharp (U.S.A.) used the operation of vasectomy in 1899.

Presently, vasectomy is the only fool proof method of male sterilization. And the usually practised technique involves an incision, exposure of a segment of vas, which is cut and both the ends are ligated. Skin incision is resutured with stitches only to be removed after about 7 days.

The open operation, although minor, involves obvious surgical morbidity viz. infection, haematoma, sinus formation etc.. Besides this, the greatest drawback is a fear complex of an operation in rural Indian Community. The word "Operation" puts them under a great psychological distress, howsoever minor it may be.

As vas deferens is a very superficial structure and can be easily palpated and isolated from the rest of spermatic cord structures, it is possible to interrupt the lumen of vas percutaneously thereby abolishing the operation-phobia among Indian Community. And once this happens, majority would come voluntarily and the population problem - pivotal problem in India, would be solved.

An entirely new technique which does not involve complications of an open operation, was undertaken.

In the proposed study, two variants of the technique were used -

In the first variant (Technique - A) - after palpating and fixing the vas deferens, local anaesthesia 1% xylocaine (plain) was injected in the scrotal skin.

A nylon suture on a straight needle was passed through skin encircling the vas. A tight knot was tied. By this tight knot, suture would compress the vas, block its lumen. Also it would cause ischaemic necrosis and later fibrosis of vas at the site of compression.

In the second variant (Technique - B) - after fixing vas, a small 2 mm skin incision was made cutting skin and dartos. A synthetic absorbable suture material viz. polyglactin, was put on curved needle, and was passed encircling the vas. Again a tight knot enough to occulude lumen & cause ischaemic necrosis and not cutting through it, was applied.

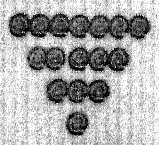
The site in both variants was sealed by tincture benzoin or Healex spray.

So the only armamenterium required consisted of towel clip, a straight cutting needle a curved needle, nylon, synthetic absorbable suture, a knife and a syringe and needle.

Patients became ambulatory immediately following the procedure and resumed their routine duties the same moment.

Since only a small area of vas was involved in this procedure with least manipulations of vas, chances of doing successful recanalization are better than in routine open vasectomy operation.

This method appears to be very simple and least time consuming and moreover extremely suitable for Indian conditions.



REVIEW OF LITERATURE

REVIEW OF LITERATURE

Vasectomy, as a procedure designed to block the passage of sperms through the vas deferens was not performed as a method of voluntary fertility control until 20th century. An early reference to vas occulusion was made by the english surgeon and anatomist John Hunter in the year 1775. John Hunter, while dissecting upon a cadavar, observed an obstructed vas deferens (on that cadavar).

Sir Astley Cooper - student of John Hunter, made an experimental study on vasectomy on dogs in 1830. He ligated artery and vein of spermatic cord on one side without touching vas and on other side he ligated the vas deferens. He found a gangrenous testis on the side where artery & vein were ligated. Whereas on the opposite side, tissue remained healthy and sperms survived in the ductal tract upto the point of ligation. The epididymis or convoluted portion of vas gradually enlarged to accomodate sperms.

In 1883 Felix Guyou - a french surgeon concluded that blocking the vas caused atrophy of prostate gland. This finding encouraged genitourinary

surgeons of that decade to perform vasectomy concurrently with prostate operation in order to reduce the size of gland and to avoid postoperative epidymoorchitis.

One of the first operations is credited to Dr. H. G. Lennender of Upsala, Sweden who published a report of his technique in 1897.

Dr. Herry sharp (U.S.A.) reported performing a vasectomy in 1899 on a mentally ill patient whose complaint was excessive masturbation. The patient consented to the operation, believing that it would relieve his obsession. The results, undoubtedly psychological, was favourable. In the next ten years he performed 456 voluntary vasectomies on both healthy and institutionalized men for the purpose of sterilization.

In the early part of 20th century, a reference of vasectomies being done, for eugenic reasons on criminals, mentally ill, retarded, hereditary diseases, is found. Paradoxically, even as it's contraceptive effects were being documented, the operation was performed by Eugene Steinach - an Austrian exile, for the purpose of overall bodily rejuvenation.

From his experiments on rats, Steinach discovered that following ligation of vas, the sperm

producing tissue degenerated. And at the same time there was hypertrophy of the hormone producing tissue, which, in it's turn caused renewed germ cell production.

This process was originally thought to counter the effects of aging. Later, Steinach's hypothesis was refuted but doctors and scientists continued to advocate the operation for contraceptive purposes.

National family planning programmes were first initiated in South Asia in 1950's and 1960's. Vasectomy fulfilled the obvious need for a simple inexpensive birth control technique that could be offered on a one time basis.

Although the number of vasectomies performed throughout the world fluctuates from year to year, depending upon publicity, national budgets & programme guidelines, the simple procedure of vasectomy has clearly taken its place as a major technique in voluntary family planning.

In usually practiced method of vasectomy, an incision is made, the vas deferens is exposed, cut and both ends are ligated and then skin sutured. The patient has to revisit for stitch removal after 7 days. With this open procedure there are many complications viz. infection, haematoma, swelling, pain, sperm

granuloma, epididymitis, psychological effects of an operation and occasionally a sinus formation.

The open method also requires reasonable number of instruments viz. knife, scissors, suture material, artery forceps, Alles' tissue holding forceps and needle etc..

As vas deferens can be easily felt and isolated from rest of the structures of spermatic cord, through scrotal skin only, some persons tried to block the vas blindly without making any incision. G. S. Sekhon (1970) developed an instrument for percutaneous vasectomy. This instrument encircled the vas and diathermy snare wire was introduced through a special needle. He devided vas as single, double and triple cuts. Instead of diathermy divisions, the vas may be prolapsed through a small stab wound using another new instrument - a skin protector in conjugation with vasectome. In contrast to single cut technique all the other methods appeared to be quite satisfactory in achieving the objective. The chances of injury to testicular artery by blind diathermy technique must be quite rare because the testicular artery is located a little farther away from vas, with a separate leash of veins in pampiniform plexus. Even if worst comes to worst, still the testicular artrophy

need not follow because of a rich collateral circulation (Koontz, 1965).

According to Schmidt et al (1974) fulguration of lumen of vas deferens, is the optimal method of sealing the cut ends of the vas at vasectomy. Minimum spermatic granulomas have followed in over 1600 cases. However, standard types of electro-surgical units may destroy the full thickness of vas wall with resulting complications. A unit has been designed with a power source of a single 22.5 volts dry battery. A bipolar needle is used, hence grounding of the patient is unnecessary. Several hundred vasectomies can be done before revewing the battery. Complete destruction of the epithelial layers is obtained with little damage to muscular wall. Neither spermatic granuloma nor failures have resulted.

Two studies carried out separately in the year 1982 and 1983 at M.L.B. Medical College, Jhansi by Dr. Agarwal, S.L. regarding percutaneous fulguration of vas and its comparative evaluation with open vasectomy showed encouraging results.

MATERIAL AND METHODS

MATERIAL AND METHODS

The study was carried out in Maharani Laxmi Bai Medical College & Associated Hospital, Jhansi.

1. SUBJECTS:

Two groups of patients were included in the study.

Group (I)

Consisted of patients of Benign Prostatic Hypertrophy coming for definitive prostatic surgery. For them vasectomy is prerequisite for prostatectomy to prevent postoperative epididymoorchitis. Sixteen cases were included in the study. And in each patient technique (A) was applied on right side and technique (B) on left side.

Group (II)

Persons coming for voluntary sterilization. 26 cases were included in this group. Of these, 12 cases underwent ligation by technique (A) and 14 by technique (B).

2. EQUIPMENTS - Consisted of :-

(a) Towel clip for vas fixation.

(b) Straight cutting and curved needle.

(c) Triangular knife for making small incision.

(d) Nylon thread.

(e) Synthetic absorbable suture material viz. polyglactin suture.

3. STERILIZATION

Various physical and chemical methods of sterilization were tried. But over all, it was found that autoclaving, lysol and cidex (R) consisting of 2% glutaraldehyde with activator are most suitable.

GROUP (I) SUBJECTS

(a) PREOPERATIVE PREPARATION

The informed consent was obtained in each case. Part was prepared by shaving the area immediately before the procedure. Xylocaine sensitivity was determined and tetanus prophylaxis was given. Preoperative sedation in form of Diazepam 10 mg and Pentazocine 30 mg was administered intravenously slowly.

(b) OPERATIVE PROCEDURE

Supine position was used. Meticulous asepsis was observed. Part was cleaned and drapped.

TECHNIQUE (A)

Vas on right side was palpated and brought to surface between thumb and fingers. Local anaesthesia (1% xylocaine) was infiltrated from scrotal skin down

to vas by a fine hypodermic needle.

Vas was then fixed by towel clip. A straight cutting needle was passed through scrotal skin below the vas and carried through to other side encircling vas. A tight knot sufficient enough to compress the lumen of vas and cause its ischaemic necrosis was applied.

The site was sealed with tincture benzoin or Healex Spray.

TECHNIQUE (B)

Vas on left side was palpated, and fixed as above. Local anaesthetic agent was infiltrated in similar fashion.

A small incision 2 mm in size was made by triangular knife cutting skin & dartos only.

A curved needle (carrying in it a synthetic absorbable material) was passed so as to encircle vas. A tight knot was applied in similar fashion.

The site was sealed with tincture benzoin or Healex Spray.

GROUP (II) SUBJECTS

(a) PREOPERATIVE PREPARATION

The informed consent was obtained in each case. Part was prepared by shaving the area immediately before procedure. Xylocaine sensitivity was determined and tetanus prophylaxis was given. Then patient preoperative sedation in form of Diazepam 10 mg and Pentazocine 30 mg.

was administered intravenously slowly.

(b) OPERATIVE PROCEDURE

Supine position was used. Meticulous asepsis was observed. Part was cleaned and drapped.

Technique (A) was applied in 12 persons and Technique (B) in 14 persons.

A proforma enlisted full details of these subjects (See Annexure - I).

(c) AFTER TREATMENT

Group (I) Subjects:

Immediately after the procedure patients moved to their beds and were given analgesic tablets only.

Each of them was followed to observe pain, tenderness, haematoma, swelling, pus, fever and epididymoorchitis.

Exploration of ligated segment of vas - was undertaken at the time of definitive prostatic surgery at varying intervals of time from 7 to 30 days.

Just before doing prostatectomy, vas was exposed through a longitudinal scrotal incision. A segment of vas displaying ligatured site as well as healthy part on either side of it was dissected free and removed. Remaining ends of vas were ligated.

Wound was closed back by stitches and sealed with tincture benzoin.

Similar procedure was done on opposite side to remove segment of vas and wound closed and sealed.

This removed segment of vas was studied for -

- Gross changes.
- Patency by saline & air injection test.
- Histopathological examination.

Group (II) Subjects

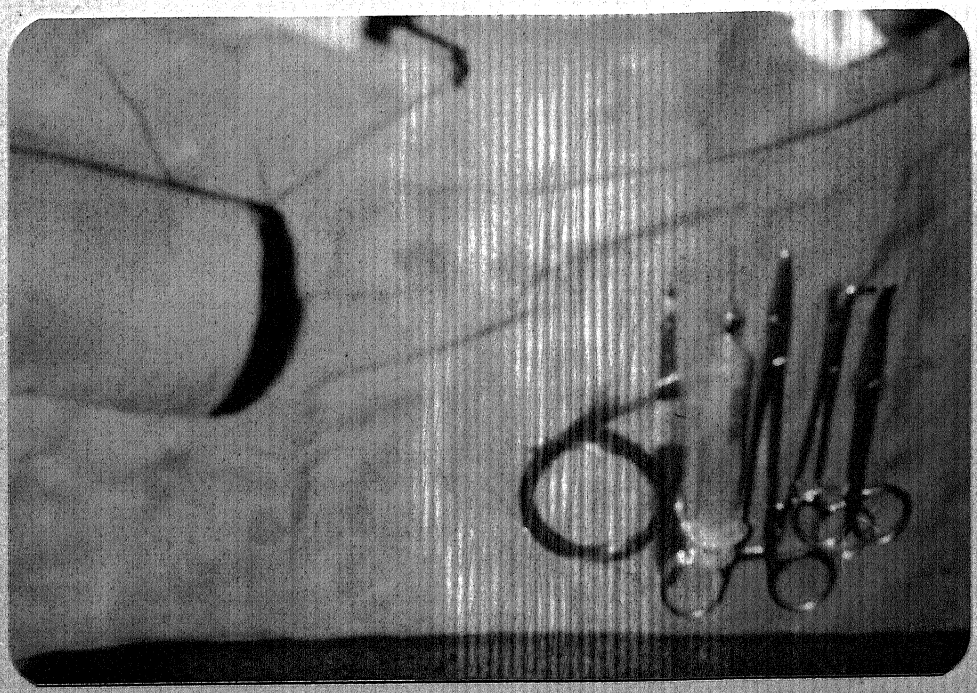
The patients were sent back home the same moment and advised to use analgesics. Prophylactic antibiotic (Cap. Tetracycline) was given for 3 days.

They were followed up for pain, tenderness, swelling, haematoma, pus formation, fever and epididymoorchitis for 7 days.

Nylon suture was removed after 21 days. Seminogram was performed every fortnightly for 3 months.

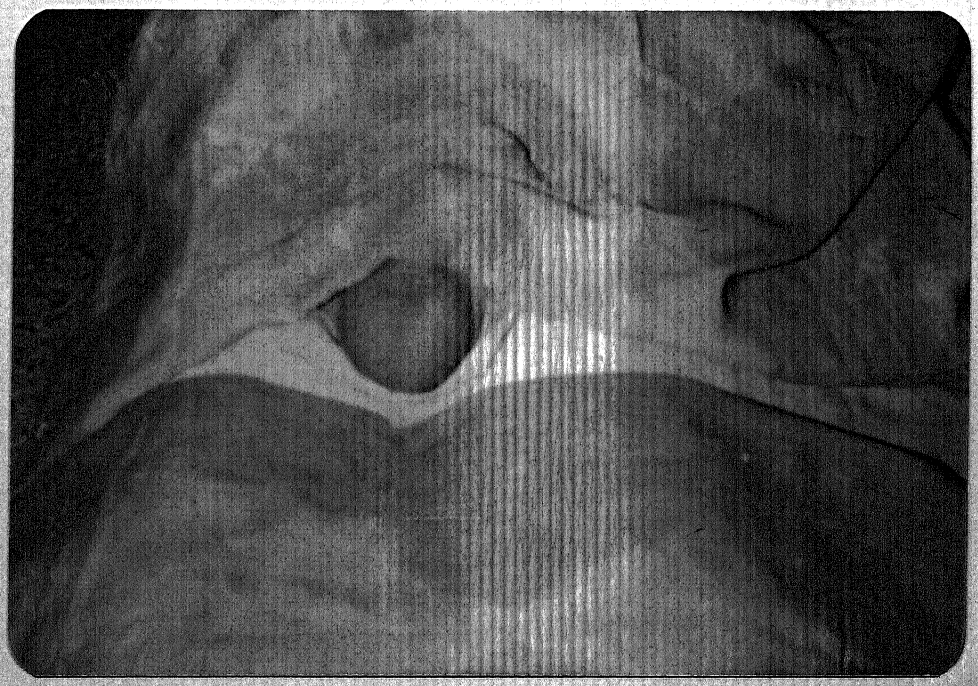
Condoms were supplied to them and they were instructed not to indulge in sexual intercourse without condoms right from the time of ligation till proved azoospermic by seminogram report.

PHOTOGRAPH No. 1



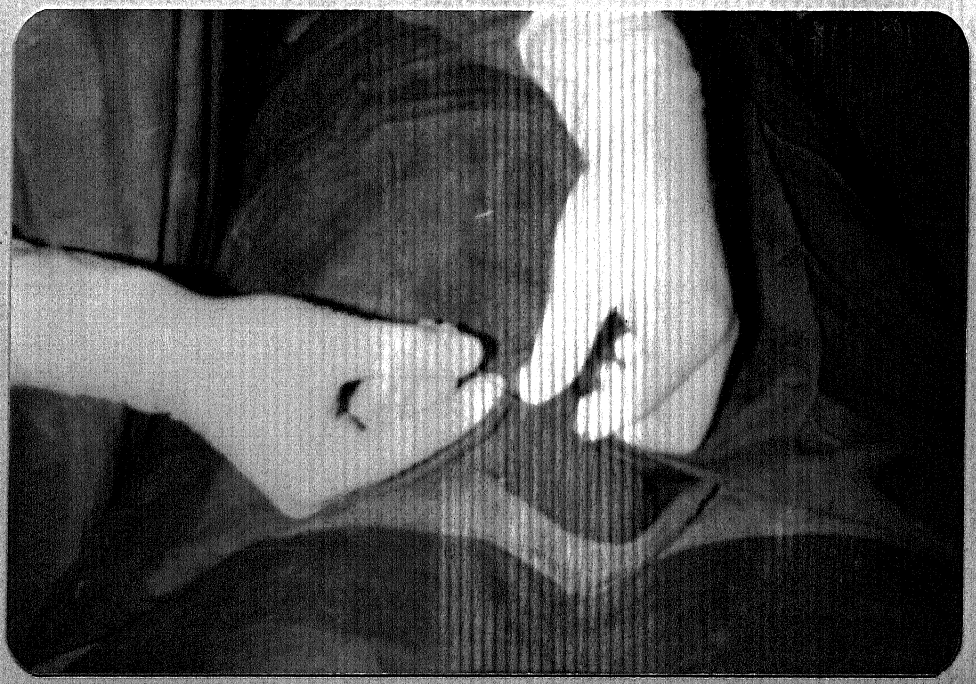
Showing armamenterium required for "Percutaneous ligation of vas". From left to right - Nylon thread (Bunch), Triangular knife, Syringe Needle containing local anaesthetic agent, Needle holder, Towel clip and Scissors.

PHOTOGRAPH No. 2



Showing draps in position after part has been thoroughly prepared with antiseptic solution.

PHOTOGRAPH No. 3



TECHNIQUE (A)

Showing thumb and index finger of left hand holding firmly the isolated vas deferens (from rest of the cord structure) and a needle in right hand pointing the surface look of vas.

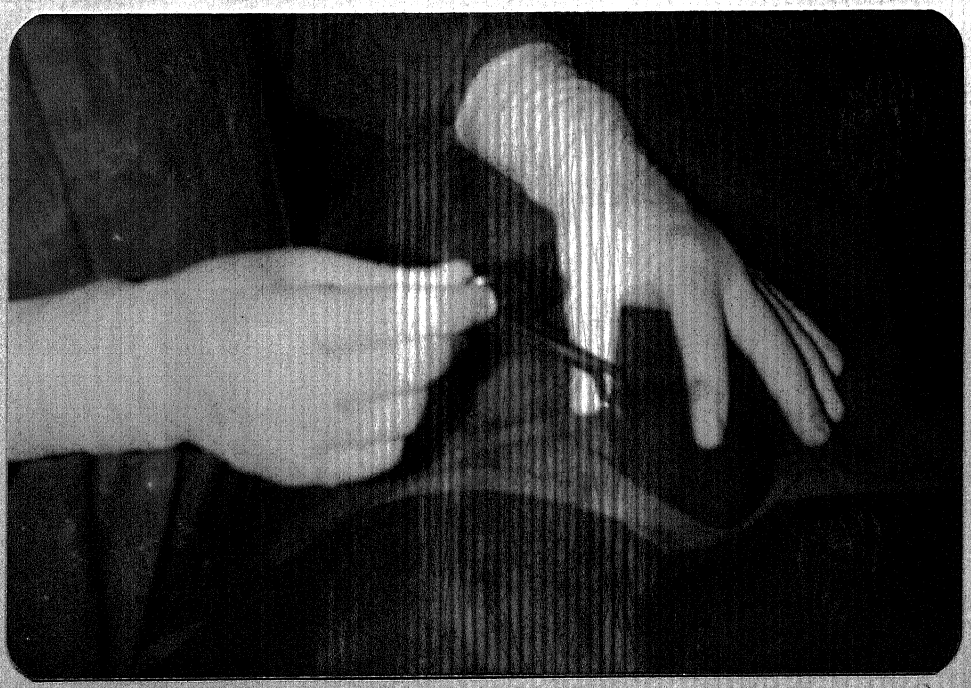
PHOTOGRAPH No. 4



TECHNIQUE (A)

Vas deferens is still firmly held by left hand and xylocaine being infiltrated into the scrotal skin down to vas has been displayed.

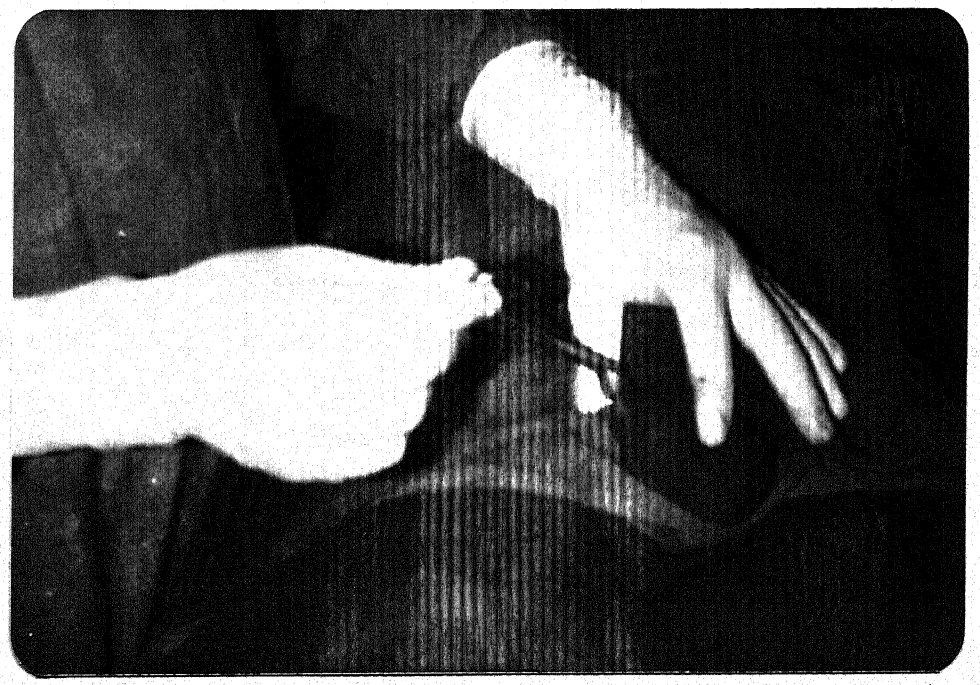
PHOTOGRAPH No. 5



TECHNIQUE (A)

Showing fixation of vas deferens by towel clip percutaneously. Vas has been made prominent by slight pull.

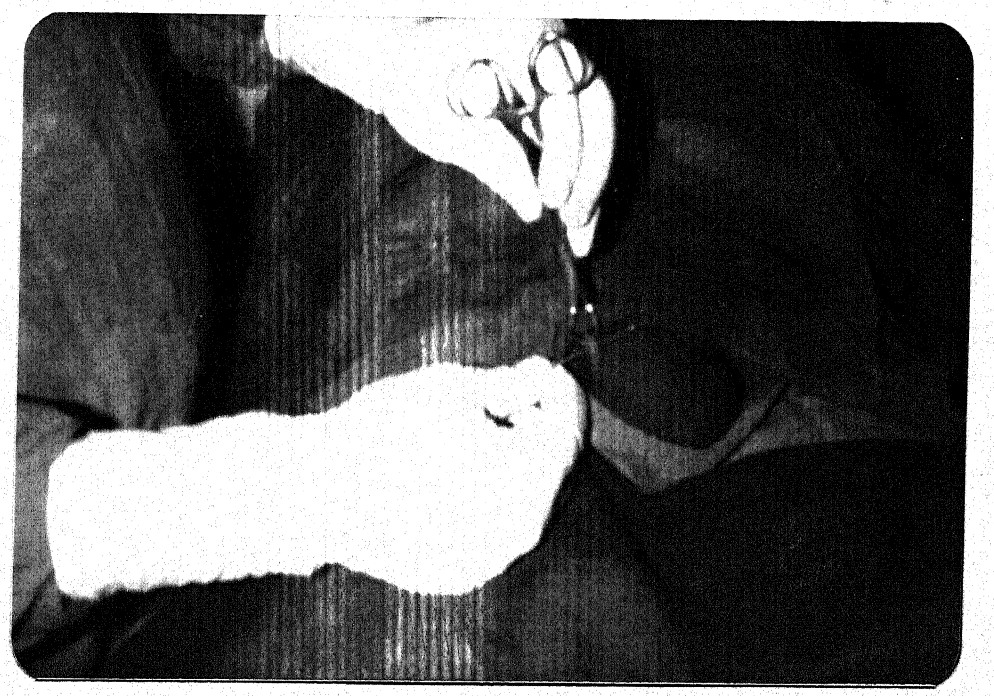
PHOTOGRAPH No. 5



TECHNIQUE (A)

Showing fixation of vas deferens by towel clip percutaneously. Vas has been made prominent by slight pull.

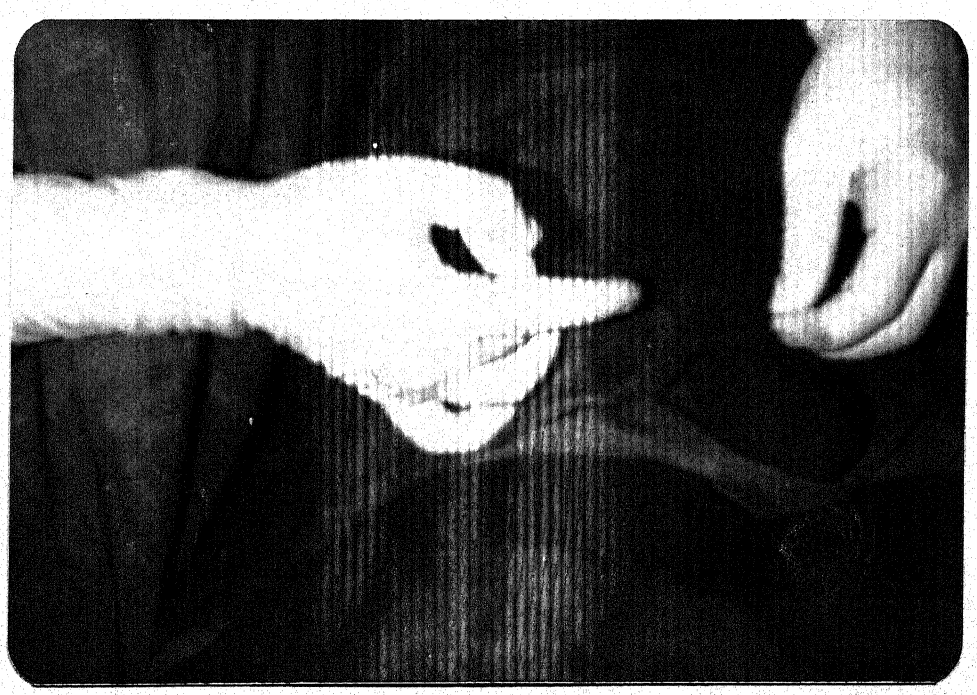
PHOTOGRAPH No. 6



TECHNIQUE (A)

Showing a straight needle being passed below vas. Needle contains nylon on it.

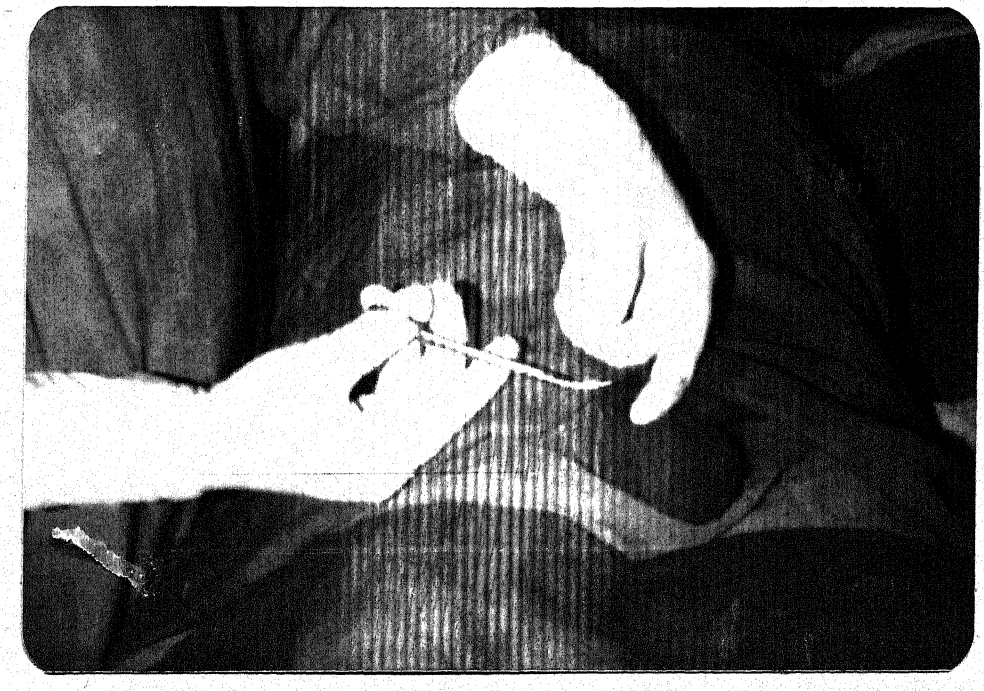
PHOTOGRAPH No. 7



TECHNIQUE (A)

Needle was passed and now nylon thread encircles the vas deferens. A knot being applied has been displayed.

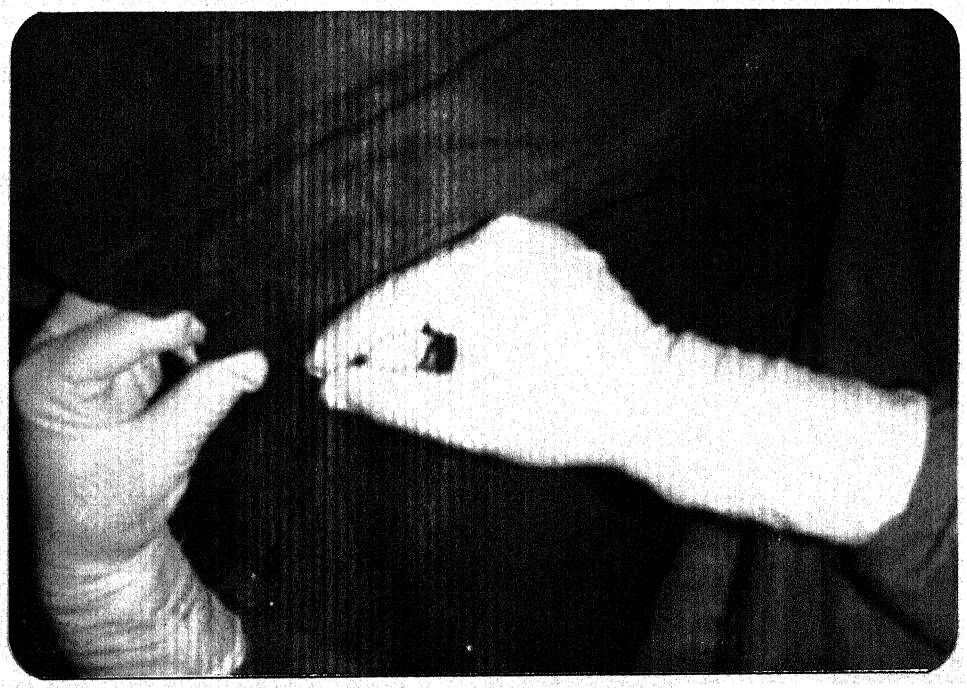
PHOTOGRAPH No. 8



TECHNIQUE (A)

A tight knot has been applied and nylon thread is being cut by scissors.

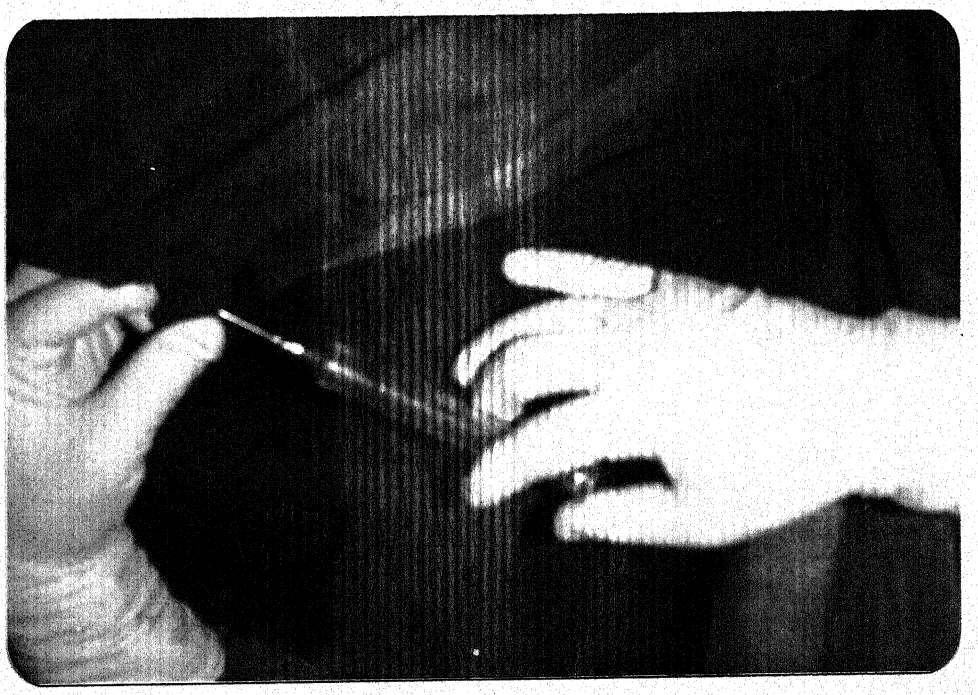
PHOTOGRAPH No. 9



TECHNIQUE (B)

Showing thumb and finger of left hand holding firmly the isolated vas and a needle in right hand pointing the surface look of vas.

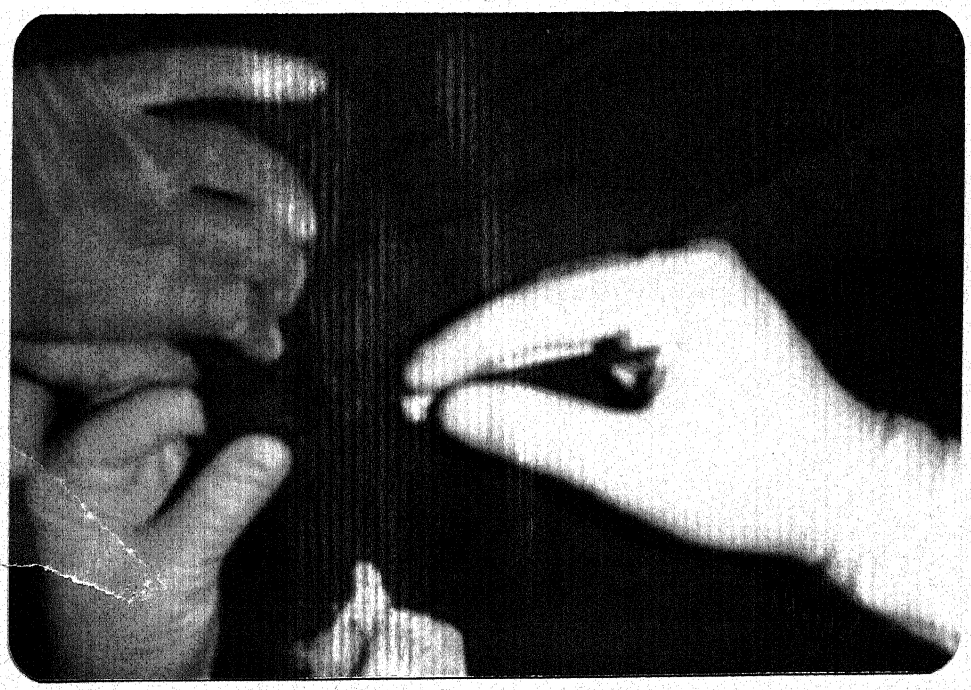
PHOTOGRAPH No. 10



TECHNIQUE (B)

Showing infiltration of xylocaine in scrotal layers down to vas. The vas is still firmly held.

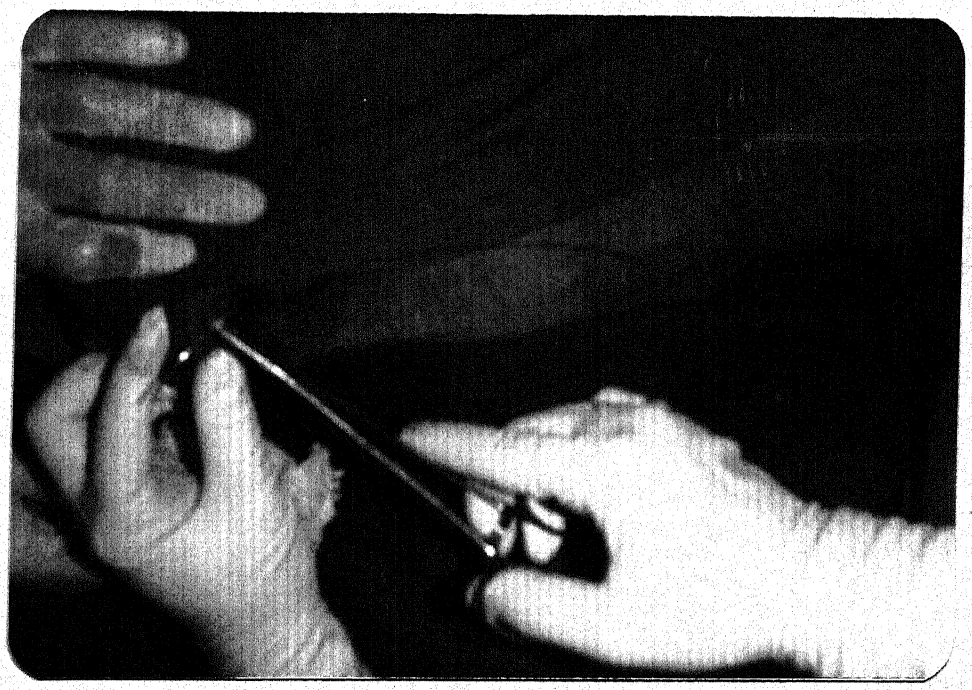
PHOTOGRAPH No. 11



TECHNIQUE (B)

The vas is still firmly held by the left hand while knife in right hand makes a small 2mm incision cutting skin and dartos only.

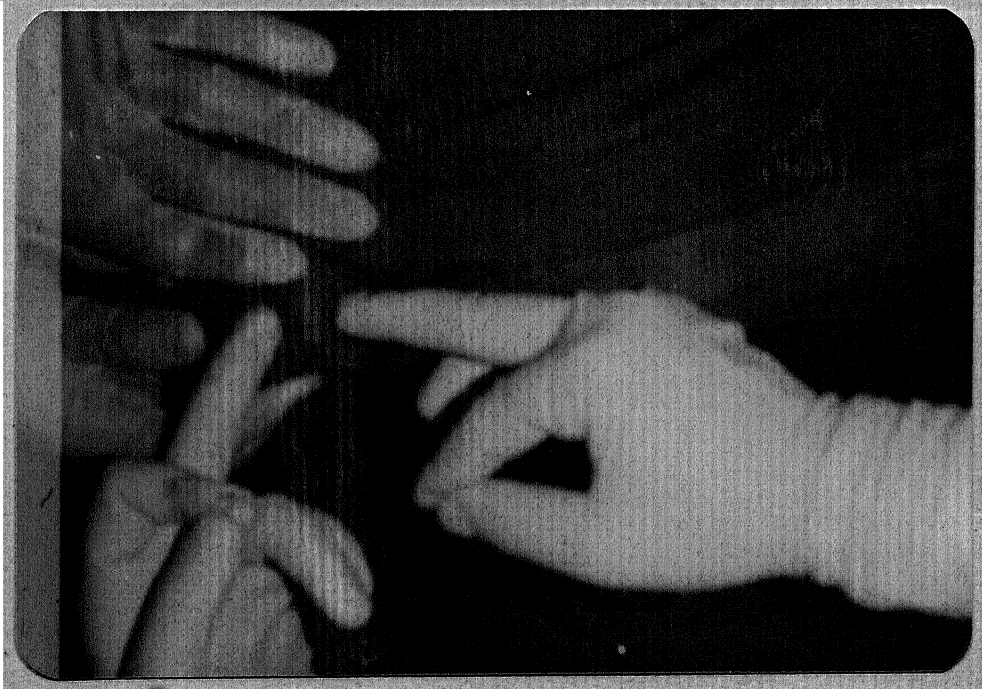
PHOTOGRAPH No. 12



TECHNIQUE (B)

A curved needle on needle holder containing nylon thread on it has been passed such that vas comes into the concave hollow of needle.

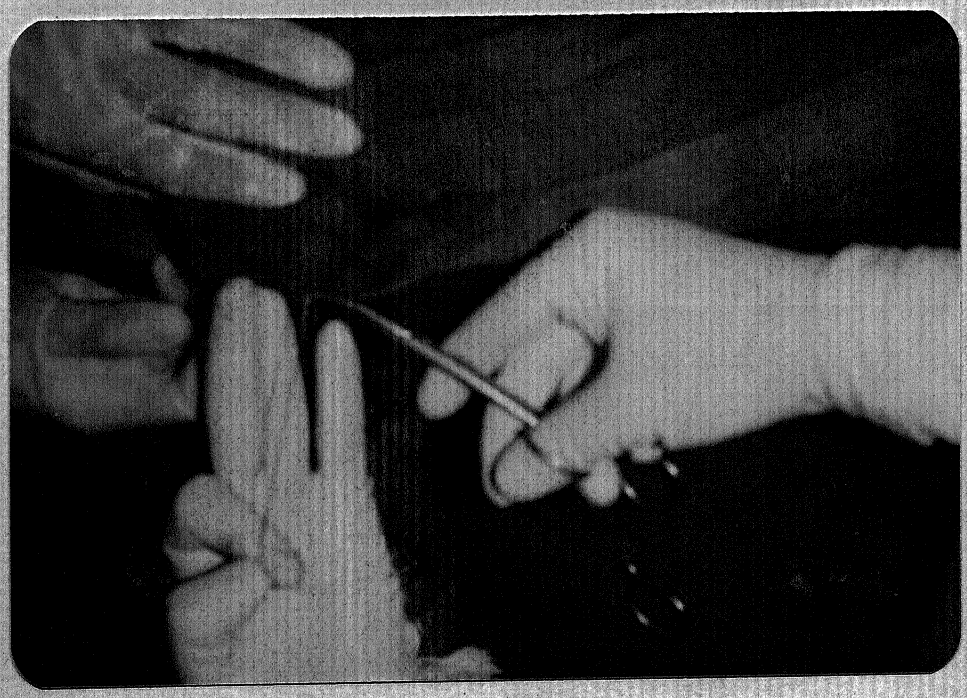
PHOTOGRAPH No. 13



TECHNIQUE (B)

Needle has been passed and removed. The nylon thread which was mounted on the needle and encircles vas, has been displayed.

PHOTOGRAPH No. 14



TECHNIQUE (B)

A knot tight enough to compress vas and cause its ischaemic necrosis has been applied and thread is being cut by scissors.

OBSERVATIONS

O B S E R V A T I O N S

The study was carried out initially in 16 patients of Benign prostatic hypertrophy admitted to surgical wards of M.L.B. Medical College, Hospital, Jhansi for definitive surgery. This technique was then applied to 26 persons coming for voluntary sterilization to this hospital.

Table No. 1

Showing relative percentage of experimental and voluntary cases.

Sl. No.	Cases	Total number of patients	Percentage
1.	B.P.H. Cases (Group-I)	16	38.09
2.	Voluntary Cases (Group-II)	26	61.91
	Total	42	100.00

So, of total, 38.09% population consisted of Benign prostatic hypertrophy cases & 61.91% population of voluntary cases.

Table No. 2

Showing age distribution of patients of B.P.H. undergoing percutaneous ligation of vas (Group-I)

Sl. No.	Age group (years)	Number of patients	Percentage
1.	50 - 55	1	6.25
2.	55 - 60	2	12.50
3.	60 - 65	7	43.75
4.	65 - 70	4	25.00
5.	70 - 75	2	12.50
	Total	16	100.00

The maximum number of patients of benign prostatic hypertrophy subjected to percutaneous ligation of vas were in the age group 60 - 65 years and constituted 43.75% of all cases.

Table No. 3

Showing age incidence of persons undergoing percutaneous ligation of vas as a method of fertility control (Group -II)

Sl. No.	Age group (years)	Number of persons	Percentage
1.	20 - 25	-	00.00
2.	25 - 30	13	50.00
3.	30 - 35	7	26.92
4.	35 - 40	4	15.39
5.	40 - 45	2	7.69
6.	45 - 50	-	00.00
	Total	26	100.00

Maximum number of persons undergoing percutaneous ligation of vas as a method of fertility control were in the age group 25 - 30 years and constituted 50% of cases.

Table No. 4

Showing percentage distribution of 2 variants of technique applied to voluntary cases(Group-II).

Sl.No.	Technique	Total No.	Percentage
1.	Technique (A)	12	46.15
2.	Technique (B)	14	53.85
	Total	26	100.00

Table No. 5

Showing findings at the time of exposure of vas before starting definitive prostatic surgery (Group- I).

Total No. of subjects = 16

Appearance of Constriction Ring at the site of ligature (Blackish due to ischaemia & subsequent necrosis).				Complete division of vas				Obliteration of vas lumen (saline injection test).			
Right		Left		Right		Left					
Total No.	%age	Total No.	%age	Total No.	%age	Total No.	%age	Total No.	%age	Total No.	%age
16	100	16	100	2	12.50	4	25.00	7	43.75	9	56.25

There was complete division of vas in 12.50% cases by technique (A) (Right side) and in 25.00% cases by technique (B) (Left side). Whereas complete obliteration was obtained in 43.75% cases by technique (A) and in 56.25% cases by technique (B).

Table No. 6

Showing prominant Histopathological findings of above cases (B.P.H. Cases).

Specimen	Side	Evidence of reaction of fibrosis	Complete obliteration of lumen
7th day specimen	Right	Mild	Nil
	Left	Mild	Nil
10th day specimen	Right	Mild	Nil
	Left	Mild	Nil
14th day specimen	Right	A bit more	Nil
	Left	Moderate	Nil
18th day specimen	Right	Moderate	Nil
	Left	Good	Obliterated
21st day specimen	Right	Good	Obliterated
	Left	Good	Obliterated
30th day specimen	Right	Good	Obliterated
	Left	Good	Obliterated

Histopathological examination of the resected segment of vas showed hyalinization and fibrosis of the wall. The epithelial lining showed marked proliferation and multilayering of the cells resulting in narrowing & occulusion of the lumen. Moderate mononuclear inflammatory reaction was also seen around vas.

By technique (A) vas showed microscopic obliteration in 21 days & by technique (B) it showed obliteration in 18 days.

Table No. 7

Showing complications following percutaneous ligation of vas (on B.P.H. Cases i.e. group-I).

Total No. of subjects = 16

Sl. No.	Complications	Number of patients	Percentage
1.	Haematoma	0	00.00
2.	Infection	2	12.50
3.	Epididymoorchitis	0	00.00
4.	Skin ulceration	0	00.00
5.	Others	0	00.00
	Total	16 cases	

So, it is obvious from table that only 12.50% of studied population got wound infection. No other complication was there.

Table No. 8

Showing sperm count at 2, 4, 6, 8 and 12 weeks after percutaneous ligation of vas by technique (A) (Group-II).

Total No. of subjects = 12

Sl. No.	Sperm count	Count at 2 weeks		Count at 4 weeks		Count at 6 weeks		Count at 8 weeks		Count at 12 weeks	
		No. of patients	%age	No. of patients	%age	No. of patients	%age	No. of patients	%age	No. of patients	%age
1.	Normal Count	6	50.00	0	00.00	0	00.00	0	00.00	0	00.00
2.	Oligospermia	6	50.00	7	58.33	6	50.00	5	41.66	5	41.66
3.	Azoospermia	0	00.00	5	41.66	6	50.00	7	58.33	7	58.33

So, after a follow-up for 3 months, out of 12 cases studied by technique (A) 6 were oligospermic after 2 weeks (50 %). At 4th week 7 (58.33%) were oligospermic and 5 (41.66%) were azoospermic. At 3rd month 5 (41.66%) remained oligospermic as against 7 (58.33%) who turned azoospermic.

Table No. 9

Showing sperm count at 2, 4, 6, 8 and 12 weeks after percutaneous ligation of vas by technique (B) (Group-II).

Total No. of subjects = 14

Sl. No.	Sperm count	Count at 2 weeks		Count at 4 weeks		Count at 6 weeks		Count at 8 weeks		Count at 12 weeks	
		No. of patients	%age	No. of patients	%age	No. of patients	%age	No. of patients	%age	No. of patients	%age
1.	Normal Count	4	28.57	0	00.00	0	00.00	0	00.00	0	00.00
2.	Oligospermia	10	71.43	10	71.43	7	50.00	4	28.57	3	21.42
3.	Azoospermia	0	00.00	4	28.57	7	50.00	10	71.43	11	78.58

So, after a follow-up for 3 months out of 14 cases studied by technique (B) 10 (71.43 %) turned oligospermic after 2 weeks and after 4 weeks 4 (28.57 %) became azoospermic. At 3rd month 11 (78.58 %) cases turned azoospermic while only 3 (21.42 %) remained oligospermic.

Table No. 10

Showing incidence of complications in voluntary cases of percutaneous ligation (Group-II).

Total No. of subjects = 26

Sl. No.	Complications	Number of persons	Percentage
1.	Infection	1	3.84
2.	Haematoma	Nil	Nil
3.	Epididymoorchitis	Nil	Nil
4.	Sinus formation	Nil	Nil
5.	Others	Nil	Nil

The table shows an obvious rate of infection to the tune of 3.84 % only. No other complication was there.

PHOTOGRAPH No. 1

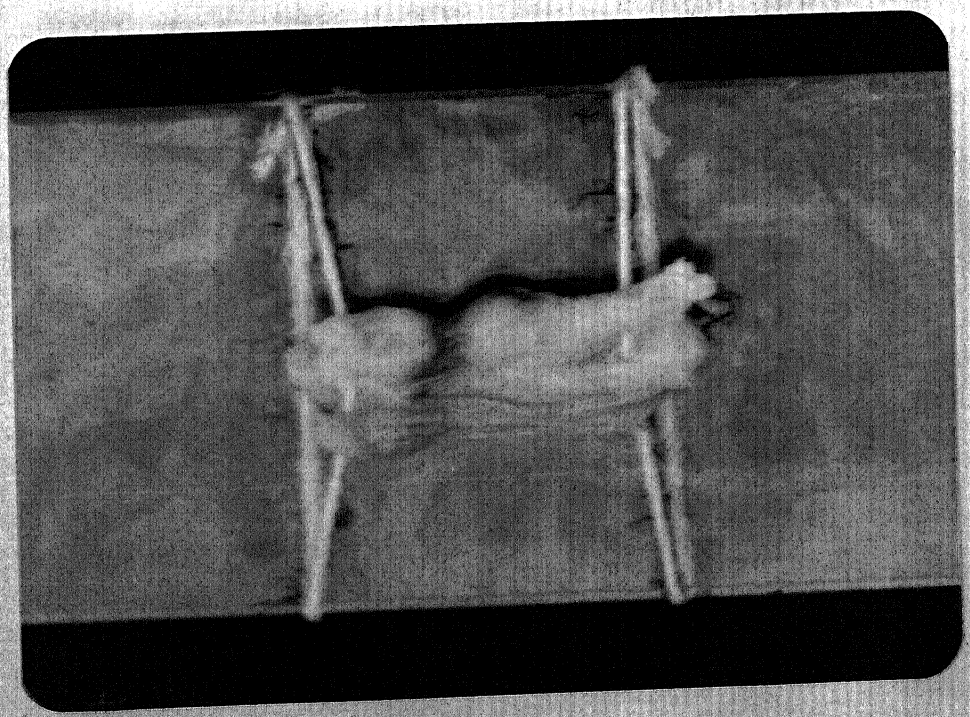
(Gross Features)



Showing a segment of vas (in which, percutaneous ligation was done 7 days ago), removed at the time of definitive prostatic surgery. Arrow shows the site of constriction ring. (done by technique 'A').

PHOTOGRAPH No. 2

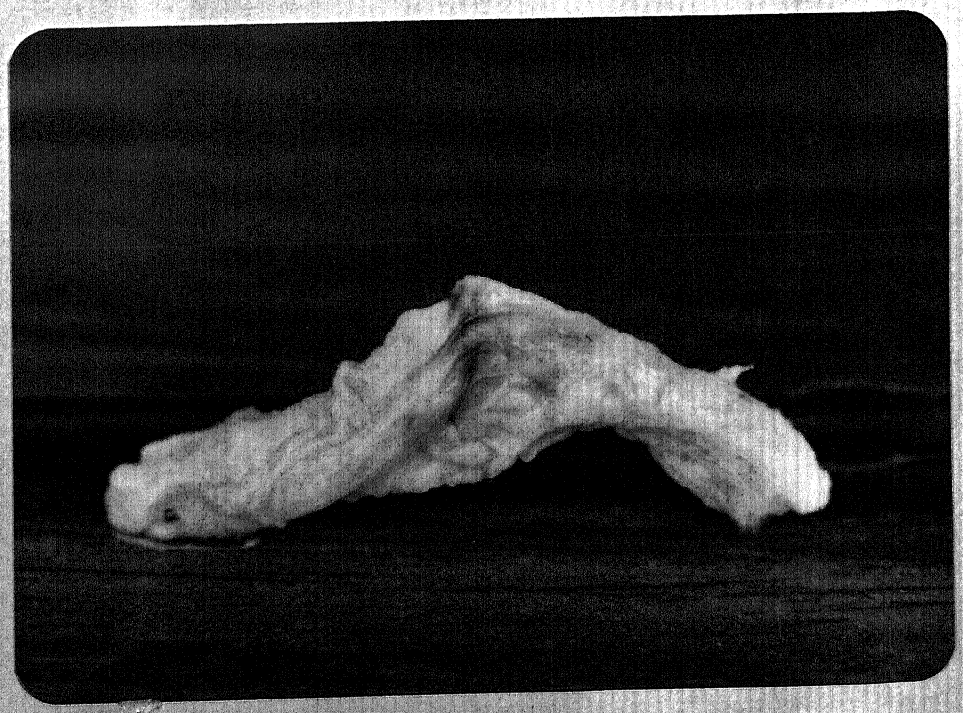
(Gross Features)



Showing a segment of vas (in which, percutaneous ligation of vas was done 10 days ago) removed at the time of definitive prostatic surgery. The lumen of vas has been laid open. A black constriction ring is visible and it is present throughout the circumference of vas. At the site of constriction ring the lumen could not be laid open fully because of partial blokage.(done by technique 'A') The specimen is mounted on a glass slide.

PHOTOGRAPH No. 3

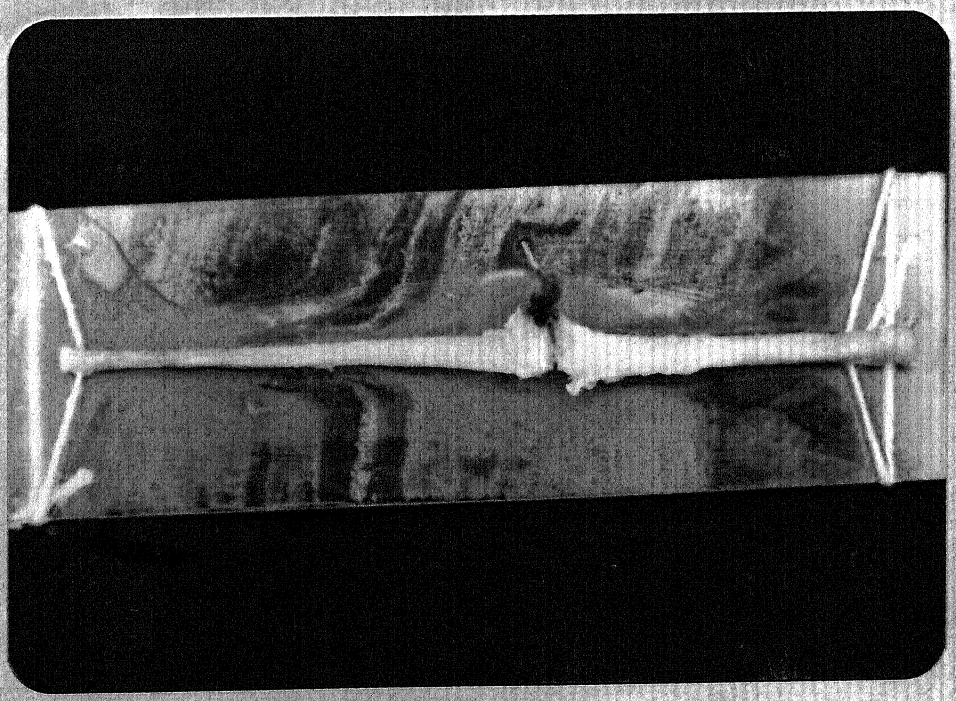
(Gross Features)



Showing a segment of vas (in which, percutaneous ligation was done 14 days ago) removed at the time of definitive prostatic surgery. Constriction ring is apparent (done by technique 'A').

PHOTOGRAPH No. 4

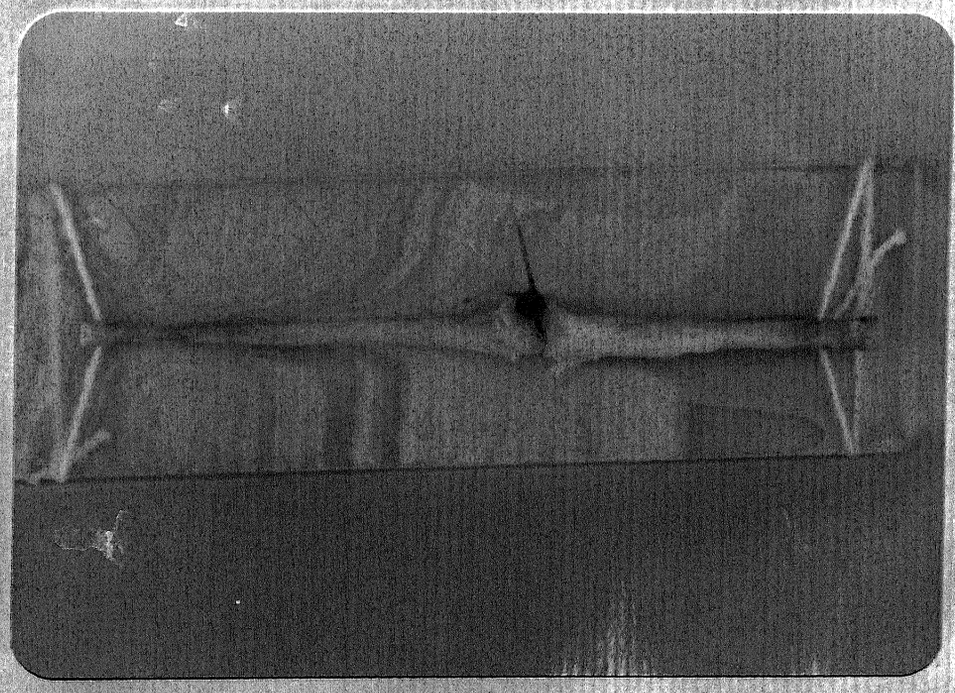
(Gross Features)



Showing a segment of vas with knot in situ (in which, percutaneous ligation was done 18 days ago) removed at the time of definitive prostatic surgery. Saline injection into the lumen of vas showed blockade (done by technique 'A'). The specimen is mounted on a glass slide.

PHOTOGRAPH No. 5

(Gross Features)

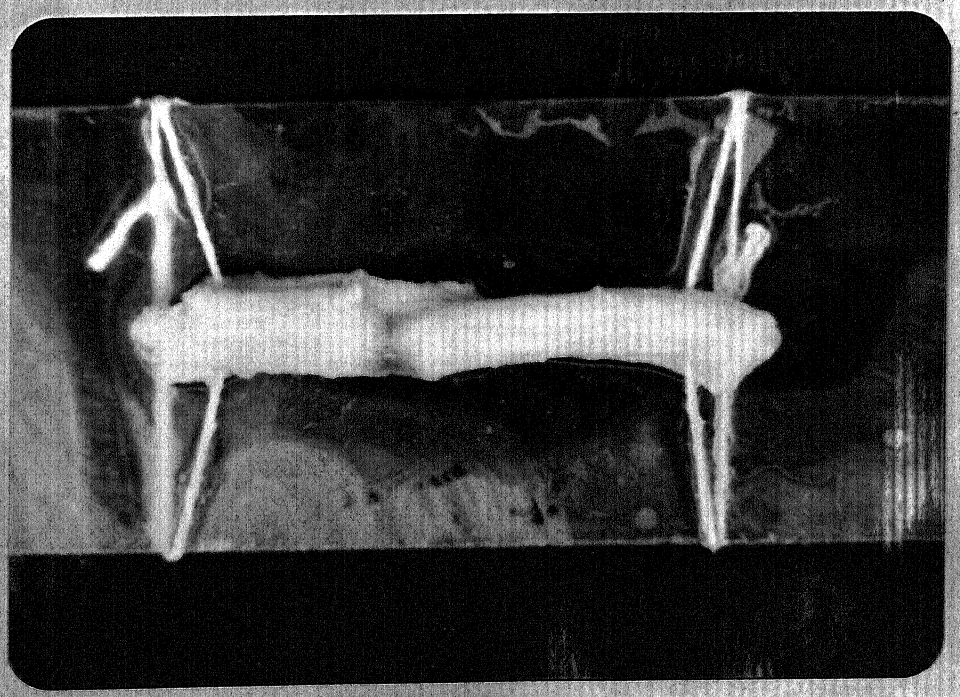


Showing a segment of vas with knot in situ (in which, percutaneous ligation was done 18 days ago) removed at the time of definitive prostatic surgery. Saline injection showed blockade of the lumen (done by technique 'B'). The specimen is mounted on a glass slide.

Vas is cut through almost half way down (from above).

PHOTOGRAPH No. 6

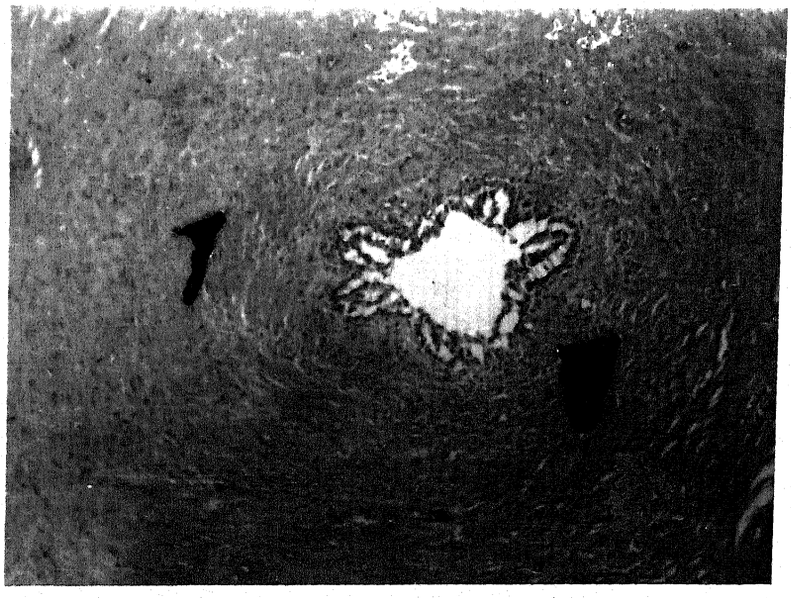
(Gross Features)



Showing a segment of vas (in which, percutaneous ligation was done 21 days ago) removed at the time of definitive prostatic surgery. Constriction ring as well as partial cutting through of vas as a whole from both the sides is very much clear.

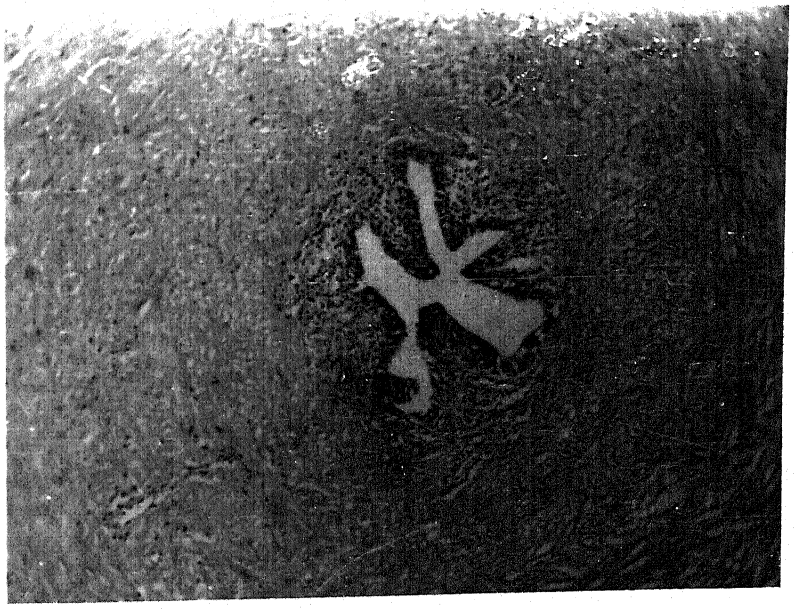
Saline injection showed blockade of lumen of vas. (done by technique'B') The specimen is mounted on a glass slide.

FIGURE NO. 1



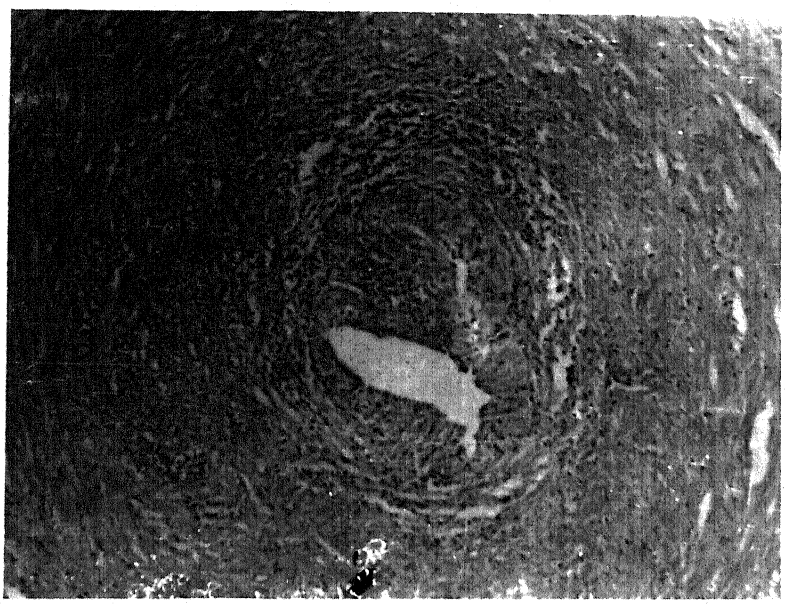
Microphotograph of transverse section of vas of a patient 2 cm. away from the site of percutaneous ligation, using nylon suture, showing patent lumen with single cell mucosal lining. H & E X 70.

FIGURE NO. 2



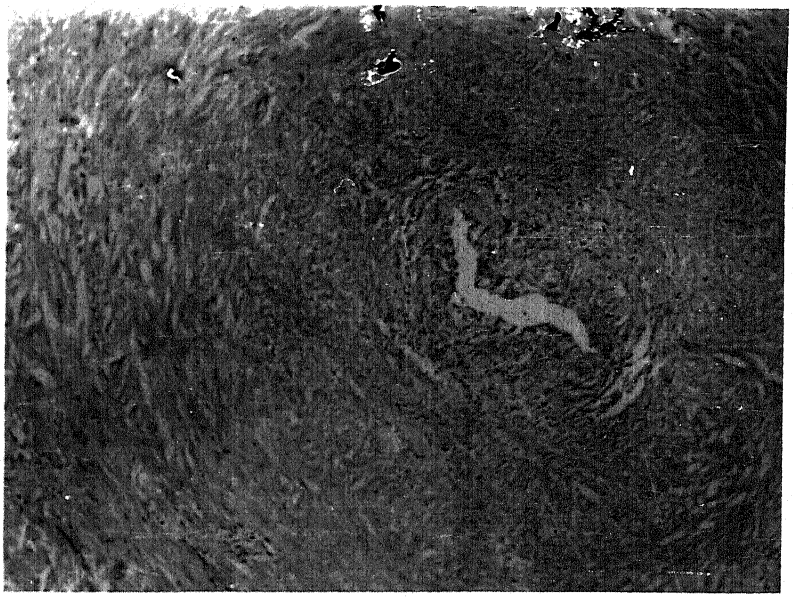
Microphotograph of transverse section of vas of a patient at the site of percutaneous ligation, using nylon suture, 7 days after the procedure showing narrowing and distortion of lumen with multiple layering of mucosal lining and moderate inflammatory reaction. H & E X 70.

FIGURE NO.3



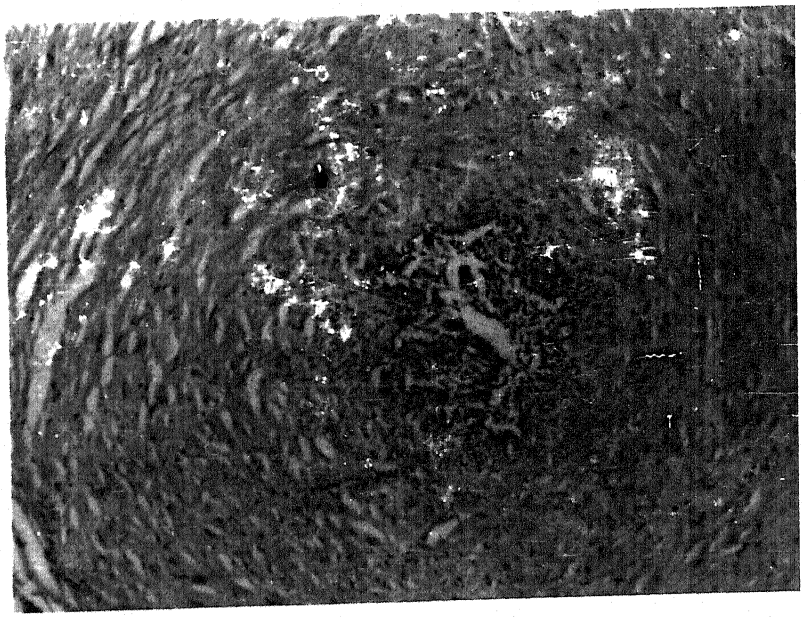
Microphotograph of transverse section of vas of a patient at the site of percutaneous ligation , using nylon suture - 10 days after the procedure showing marked narrowing of lumen due to proliferation of mucosal cells with moderate inflammatory reaction. H & E X 70.

FIGURE NO. 4



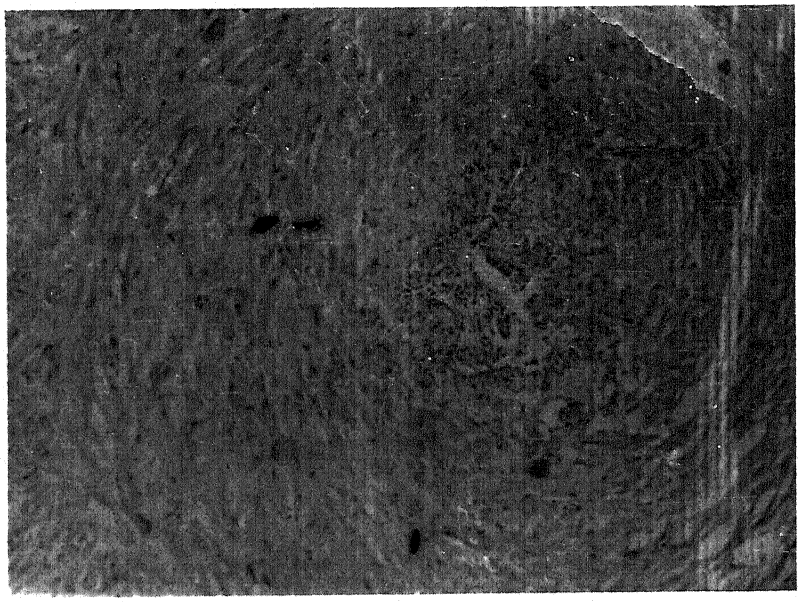
Microphotograph of transverse section of vas of a patient at the site of percutaneous ligation, using nylon suture 14 days after the procedure, showing marked narrowing of lumen and thickening of mucosal lining. H & E x 70.

FIGURE NO.5



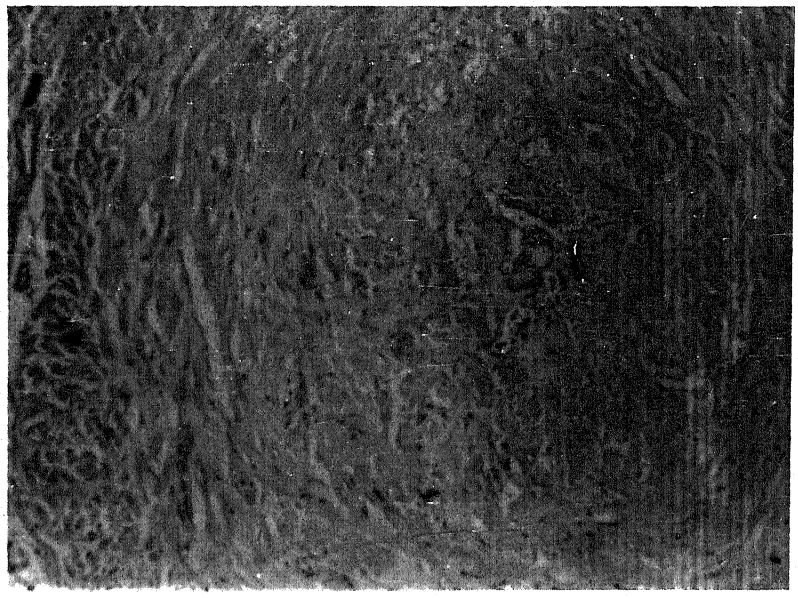
Microphograph of transverse section of vas of a patient at the site of percutaneous ligation, using nylon suture 18 days after the procedure, showing marked narrowing of lumen with thickened mucosa. H & E x 70.

FIGURE NO. 6



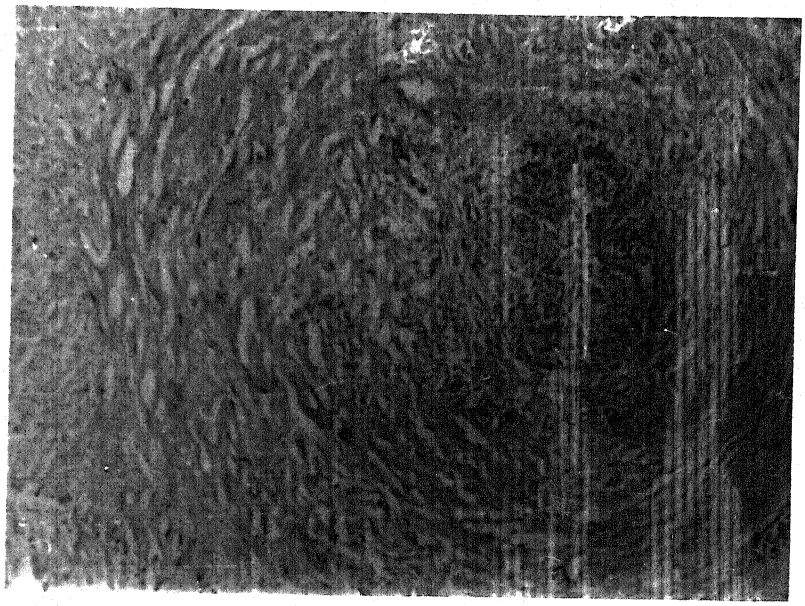
Microphotograph of transverse section of vas of a patient at the site of percutaneous ligation, using polyglactin suture 21 days after the procedure showing an almost slit like lumen with marked thickening of mucosa. H&E x 70.

FIGURE NO.7



Microphotograph of transverse section of vas of a patient at the site of percuteneous ligation, using polyamide suture, 21 days after the procedure showing a completely blocked lumen with thickening and hyalinization of mucosal lining. H & E x 70.

FIGURE No. 8



Microphotograph of transverse section of vas of a patient at the site of percutaneous ligation using nylon suture showing completely blocked lumen of vas with extensive thickening and hyalinization of mucosa, 21 days after the procedure. H & E x 70.

DISCUSSION

D I S C U S S I O N

The standard vasectomy procedure entails an open operation, in which an scrotal skin incision is made, Vas is cleared of fascial layers and cut. Both the cut ends are ligated after removing a segment of vas. The incidence of complications viz. infection, sinus formation due to non absorbable suture and failure in inexperienced hands remains high.

These factors together with fear of an "operation" in Indian community has gradually pushed vasectomy to the background as a method of family planning, as evidenced by diminishing number of vasectomies and increasing number of Laparoscopic ligations and other methods of family planning - recently in India.

It was thought that, as vas is a very superficial structure and can be separated from rest of the cord (spermatic) structures easily, if some closed method of interruption of vas lumen can be evolved, it will prevent complications and problems associated with open vasectomy as well as fear of"operation" and may result in greater acceptance of vasectomy in Indian masses.

In earlier study (Agarwal, S.L. et al., 1983) vas fulguration by insertion of an insulated needle and subsequent cauterization by an electro-surgical cautery and later on closed cutting and fulguration of both ends by cataract knife with the help of electro-surgical cautery ~~ra~~were used. The results of the latter technique were excellent and in clinical cases there was cent percent success without any complication.

The problem with the above technique was that of electricity and electro-surgical cautery was a pre-requisite. And in many Indian villages, electricity is not available. Hence it was thought to evolve a new technique which will not require electricity.

The new technique - "Percutaneous ligation of vas" involves interruption of vas lumen percutaneously partly through mechanical compression and partly through ischaemic necrosis and fibrosis.

Initially the method was tried in the patients of Benign Prostatic hypertrophy waiting for definitive surgery where vas occlusion is usually required to prevent postoperative epididymoorchitis.

At the time of difinitive prostatic surgery, at varying interval, vas was resected and gross

examination was made. It was seen that in majority of cases, vas occlusion was successful after 18-21 days. A few patients even showed complete division of vas and in others there was fibrotic nodule and fibrosis. Histopathological examination also showed evidences towards this.

Then it was tried in 26 cases volunteering for family planning measure. A well informed consent was obtained. Cases were followed for 3 months with seminogram regularly at fortnightly interval.

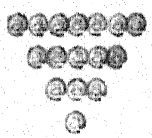
Seven cases (58.33 %) by technique (A) and eleven cases (78.58 %) by technique (B) turned azoospermic. So far complications are concerned, only one case (3.84 %) had slight infection.

As will be seen from the results, both the variants are not cent percent successful.

Since it is a begining of trial by this method, it is sincerely hoped that with some more experience, facilities and refinement of technique specially by devising a suitable instrument for holding vas, the failure rate and complication rate will go down to the extent that the technique will be acceptable to the Indian Community.

The technique as such is extremely simple, least time consuming and very economic. In fact no drug except one or two doses of analgin tablets are required and the armamenterium consists of a straight cutting needle, suture material and towel clip.

The observations indicate that if rightly practised, this technique could prove a good means of vas occlusion for mass family planning compaigns.



CONCLUSION AND SUMMARY

SUMMARY AND CONCLUSION

The clinical study of "Percutaneous ligation of vas" in a series of 16 cases of Benign prostatic hypertrophy and 26 cases volunteering for this operation as a measure of fertility control was carried out in M.L.B. Medical College, Hospital, Jhansi from June, 1983 to May, 1984.

The whole armamenterium viz. straight cutting needle, suture material & towel clips were sterlized by autoclaving.

Selected cases of Benign prostatic hypertrophy were taken having no other associated diseases viz. hernia, hydrocele etc..

Of 16 cases of Benign prostatic hypertrophy the percutaneous ligation of vas by technique 'A' was done on right side and by technique 'B' on left side of each such patient.

After a varying period of time from 7-30 days, the affected segment of vas together with healthy area on either side of site of compression, was removed at the time of difinitive prostatic surgery but before proceeding to remove the prostate.

Gross examination was done of each of these vas segments and the patency of lumen ascertained by saline injection test.

Each of these segments was subjected to histopathological examination which showed luminal occlusion, coagulation necrosis and fibrosis.

Then, the technique was tried in cases volunteering for vasectomy. In 12 cases, technique 'A' of ligation and in 14 cases, technique 'B' of ligation was done. Patients were sent back home immediately after the procedure and were asked to take analgesics if pain was there. They were simultaneously asked not to indulge in sexual activity without condoms.

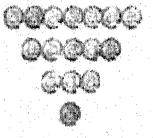
Every fortnightly the seminogram was done for 3 months.

There was no complication except infection, that too, very slight in one case, which subsided after antibiotic therapy.

The technique appeared to be very simple. It was, in a way, almost free of complications as compared to other routine methods of vasectomy. With further trials carried out properly & more resources availability, the technique may prove most popular and

easily acceptable to the Indian Community. The technique can be applied to masses in large scale family planning compaign without the fear of tetanus and associated morbidity.

Moreover since small area of vas is distroyed in the process, as opposed to a reasonably large segment in open vasectomy, recanalization operation would be easier to perform, if at all, it was required at later date.



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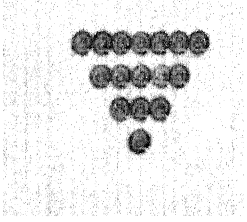
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ANNEXURE

ANNEXURE - I

P R O F O R M A

Case - Sheet

Name of the patient

Age and sex

*Ward/bed

*Date of admission

*Date of discharge

*Diagnosis

M.R.D. No./O.P.D. No.

Address

1. General Examination
 - General Condition
 - Built
 - Pulse
 - B.P.
 - Resp. rate
 - Temperature
 - Pallor
 - Jaundice
 - Cyanosis
 - Hydration
 - Clubbing
 - Oedema
 - Lymph nodes

2. Systemic Examination
 - C.V.S.
 - C.N.S.
 - Respiratory
 - Abdomen
 - Genitourinary

* Not applicable to voluntary cases.

3. PREOPERATIVE ORDERS(AND MEDICATIONS)

4. OPERATION NOTES

Surgeon
Position
Anaesthesia
Steps

5. POSTOPERATIVE ORDERS

FOLLOW-UP

Date	Pain	Tenderness	Haematoma	Fever	Pus	Epidimyitis Epididymo-orchitis.	Others

AT THE TIME OF DEFINITIVE PROSTATIC SURGERY

Preoperative orders
Operative steps(vas removal)
Postoperative orders.
Observation - Constriction ring
- Fibrosis
- Nodule
- Saline injection test
Histopathology

SEMINOGRAM REPORTS (VOLUNTARY CASES)

15 days
1 month
1½ months
2 months
2½ months
3 months

